



GLOBAL ENVIRONMENTAL ISSUES MODULE

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1. TEACHERS' GUIDE

1.1. BACKGROUND

This Module is the product of a four year project titled “Strengthening Technical Capacities to Mainstream and Monitor Rio Convention Implementation through Policy Coordination”. The project, which is financed by the Government of Guyana (GOG), United Nations Development Programme (UNDP) and the Global Environmental Facility (GEF), aims to strengthen technical capacities for mainstreaming and monitoring the achievement of the Rio Conventions. Importantly, this Module has been developed under Component 3 of the Project which focuses on Awareness of Global Environmental Values.

It should be underscored that environmental education, including awareness and communication, is considered as a cornerstone of all other components; hence the relevance of this Consultancy. It is noteworthy to recall that Agenda 21, Chapter 36 clearly states that “*Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues... Both formal and non-formal education are indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making.*”

The above-mentioned project therefore facilitated the preparation of a global environmental education module for secondary and post- secondary (technical) school students to gain a more comprehensive and in-depth understanding of global environmental issues and how local values, attitudes and behaviour affect global environmental outcomes

1.2. OBJECTIVES

1.2.1. General Goal

To create and enhance environmental awareness and knowledge in students with a view to changing their attitudes and behaviour.

1.2.2 General Objectives

- ✚ **General Objective 1:** To introduce students to basic environmental concepts and terminology".
- ✚ **General Objective 2:** To introduce students to a knowledge and understanding of the causes of the principal global environmental problems".

- ✚ **General Objective 3:** To introduce students to a knowledge of the RIO Conventions that are international responses to specific global environmental problems (climate change, loss of biodiversity, and land degradation) that require national obligations
- ✚ **General Objective 4:** To introduce students to a general knowledge of the environment in their Region and local community.

1.3 Integration of Environmental Issues into the Curriculum: Possible Pathways

The delivery and duration of this Module must be flexible, depending on the local contexts in the secondary and post -secondary institutions in Guyana. Secondary school students are required to study several subjects such as Agriculture Sciences, Biology, Chemistry, Geography, Integrated Science at the CSEC Level and Environmental Science, Geography, among many others at the CAPE level. Each subject provides opportunities for teachers to create new environmental knowledge, or to enhance what is currently being taught. On the other hand, the technical and vocational institutions can integrate or reinforce aspects of this module in subjects such as Science, Agriculture, and Engineering.

The possible pathways for Module delivery are as follows:

- ❖ Infusion of content into existing subjects that have comparative advantage with respect to the adoption of an approach that fosters a holistic understanding of global environmental issues: for example, Geography and Environmental Science at the CAPE level.
- ❖ Use of content to design Special Projects for students to undertake as a means of fulfilling School Based Assessment (SBAs) requirements.
- ❖ Delivery of the Module to schools via the E-Learning channel. In the hinterland areas, local radio stations such as Radio Paiwomak 97.1 FM in the North Rupununi will be the alternative.

1.4. Guidelines for Teachers

Teachers should consider the following recommendations:

- ❖ This module should be delivered as a form of team teaching. Teachers at secondary and post-secondary levels have been trained in specific disciplines; hence the need for a core team of teachers to deliver this Module. The same applies if the Module is used for the fulfillment of the SBAs.
- ❖ Should the Module be delivered via the E-Learning Channel or a local radio station it may be prudent to recruit an environmental education expert (who may also be a teacher in one of the institutions) to record the lessons.

- ❖ Teachers should allow students to think global and always act local.
- ❖ Teachers should start with the students' own local experiences, knowledge and everyday life
- ❖ Students should not be considered as 'passive' learners; therefore brain storming, debates, question and answer, role play/simulation exercise, You tube videos, posters, small working groups, etc. should be used as teaching and learning activities.

1.5. Implementation and Proposals for Teachers

General Objective 1: To introduce students to basic environmental concepts and terminology.

Specific Objective	Content
1) To draw a distinction between various concepts and terms commonly used in relation to the environment:	a) Clarification of concepts such as natural environment, social environment, built environment, ecosystem, greenhouse gases, ozone layer, climate change, climate variability, natural hazards, etc.
2) To understand the relationship between the environment, natural resources and economic and social development:	a) Principal characteristics of the current development model: economic growth, unlimited consumption, population and resources b) Consequences of the current development model: deterioration of environmental quality, natural resources depletion, environmental health problems etc. c) The need for Sustainable development; sustainable development goals (SDGS); green economy d) Towards a sustainable society: the need for an environmental ethic e) Promoting and supporting environmental protection and natural resource conservation through sectoral policies and everyday life.

General Objective 2: To introduce students to a knowledge and understanding of the causes and consequences of the principal/local global environmental problems.

Specific Objective	Content
<p>1) To create and enhance knowledge and understanding of the causes and consequences of air pollution</p>	<p>1) <i>Introduction to the causes and consequences of air pollution:</i></p> <ul style="list-style-type: none"> • The Enhanced Greenhouse Effect; • Global warming and climate change; • Acid rain; • The hole in the ozone layer; and • Other forms of air pollution (mercury use)
<p>2) To create and enhance knowledge and understanding of the causes and consequences of water pollution</p>	<p>2) <i>Introduction to the causes and consequences of water pollution:</i></p> <ul style="list-style-type: none"> • Urban discharges; • Industrial discharges; and • Agricultural discharges.
<p>3) To create and enhance knowledge and understanding of the causes and consequences of soil and land degradation</p>	<p>3) <i>Introduction to the causes and consequences of soil and land degradation:</i></p> <ul style="list-style-type: none"> • Households' waste; • Illegal occupation of land • Packaging; • Industrial waste (non-hazardous, hazardous, toxic and radioactive); • Agricultural wastes; and • Medical wastes.
<p>4) To create and enhance knowledge and understanding of the causes and consequences of the deterioration of the natural environment.</p>	<p>4) <i>Introduction to the causes and consequences of the deterioration of the natural environment:</i></p> <ul style="list-style-type: none"> • loss of biodiversity; • depletion of natural resources; • deforestation; • energy consumption; • desertification; and • natural hazards (related to climate variability)

General Objective 3: To introduce students to a knowledge of the RIO Conventions that are international responses to specific global environmental problems (loss of biodiversity, climate change, and land degradation) that require national obligations

Specific Objective	Content
<p>1) Students should be able to describe briefly each of the Rio Conventions and list the major objectives in each case.</p>	<p>1) The Rio Conventions: a brief description of each and Guyana’s obligations</p> <ul style="list-style-type: none"> • United Nations Convention on Biological Diversity (UNCBD) • United Nations Framework Convention on Climate change (UNFCCC) • United Nations Convention to Combat Desertification (UNCCD)
<p>2) Students should know the main legal and policy responses at the national level.</p>	<p>Environmental Protection Act (1996)</p> <p>Forest Act (2009)</p> <p>Protected Areas Act (2011)</p> <p>National Forest Policy (2011)</p> <p>Wildlife Management and Conservation Act (2016)</p> <p>National Biodiversity Strategy and Action Plan (2012-2020)</p> <ul style="list-style-type: none"> • Aligned National Action Plan (2015) • Climate Resilient Strategy and Action Plan (2014, currently being revised to evolve into a National Adaptation Plan) • Green State Development Strategy Framework (2017) and Green State Development Strategy (currently being developed) <p>Plus any other deemed relevant at the time of the delivery of the lesson.</p>

<p>3. Students should be aware of the main NGOs and Civic responses to the Rio Conventions</p>	<ol style="list-style-type: none"> 1) World Wildlife Fund-Guyana 2) Conservation International-Guyana 3) Caribbean Youth Environment Network 4) Environmental Community Health Organisation 5) Guyana Youth Environment Network 6) Private sector initiatives 7) Eco/Nature Clubs in schools
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General Objective 4: To introduce students to a general knowledge of the environment in their Region and local community.

- This section provides opportunities for students to be engaged in field related activities either as planned field trips or individual or group assignments.

Specific objectives:

- 1) To create in students an awareness of their local environment and an appreciation of the need to get involved in its protection.
- 2) To promote in students a sense of individual and collective responsibility for the protection of our natural environment.
- 3) To motivate students to take proactive measure to protect their local environment.

Suggested Teaching and Learning Activities

- ❖ Teachers can organise local field trips.
- ❖ Students can be given group projects that require field investigation and the design of models to mitigate the environmental problem/s. Models can then be used as exhibits on the school's or the technical institution's premises.
- ❖ Teachers can link activities to the SBAs, particularly, if the Module is delivered via the E-Learning Channel or local radio station.

1.6 Evaluation

The module will be evaluated on the basis of:

- Knowledge acquired by the students;
- Skills and abilities; and
- Change of attitudes during the course.

Proposed methods include tests and surveys, using pre-tests and post-tests to assess change.

1.7 General assessment of the Module

The general questions that should be asked are”

- What did you find best in the module?
- What would you improve? Why?
- What effect has this module had on you?

1.8 Recommended bibliography and resources

Suggested Bibliography

- | | |
|--------------------------------|---|
| Daily, Gretchen C. and Paul E. | ‘Population, Sustainability, and Earth’s Carrying Capacity’. <i>BioScience</i> , November 1992: pp. 761-764, 770, 771. |
| Pickering, K. and Lewis, O. | An Introduction to Global Environmental Issues. 2 nd Edition. New York: Routledge, 1997, pp. 1-619.
<i>Our Ecological Footprint</i> . Gabriola Island, B.C. Canada: New Society Publishers, 1996, pp. 61-124. |
| Wackernagel, M. and Rees, W. | |

Internet addresses

- The Brundtland Commission and Herman E. Daly <http://acwi.gov/swrr/whatis-sustainability-wide.pdf>
- Ecological Footprint:
<http://www.rprogress.org/programs/sustainabilityindicators/ef/quiz/>
- Genuine Progress Indicator:
http://www.rprogress.org/publications/2000_gpi_update.pdf
- Living Planet Report 2002 WWF:
http://www.panda.org/downloads/general/LPR_2002.pdf
- Overview of Major Environmental Sustainability Issues:
http://css.snre.umich.edu/css_edu_resources.htm

UNCBD

- <https://www.cbd.int/convention/>

UNCCD

- <https://www.unccd.int/>

UNFCCC

- <https://unfccc.int/process/the-convention/history-of-the-convention>

Videos

- Sustainability explained
https://www.youtube.com/watch?v=_5r4loXPyx8
- Handing on a sustainable future
<https://www.youtube.com/watch?v=xrXyRJV96mk>
- The Global Warming Facts You Need to Know
<https://www.youtube.com/watch?v=6SRMiMb1xgI>
- Causes and Effects of Climate Change
https://www.youtube.com/watch?v=G4H1N_yXBiA

- Cities Changing their Environment
<https://www.youtube.com/watch?v=6j2A5XLCz-o>
- Green Economy: A Tool for Sustainable Development
<https://www.youtube.com/watch?v=0uR3mil-voY>
- Human Population Growth and Natural Resources
<https://www.youtube.com/watch?v=T5V4Lt1i44I>

PSAs

- PSAs prepared by the Faculty of Earth and Environmental Sciences (FEES) as a component of the larger GEF funded project.

Posters

- Posters prepared by the Faculty of Earth and Environmental Sciences (FEES) as a component of the larger GEF funded project.

Brochures

- Brochures prepared by FEES as a component of the larger GEF funded project.

Articles

- Articles prepared by the Consultant under the larger GEF funded project.

1.9 Glossary of Terms

Acid Rain: Rain or any other form of precipitation that is unusually acidic, meaning that it has high levels of hydrogen ions (as a result of pollution by industrial burning of coal and other fossil fuels). It can have harmful effects on plants, aquatic organisms, and the built environment (particularly, infrastructure).

Built Environment: the human-made surroundings that provide the setting for human activity and are built by humans. The built environment can range from buildings to infrastructure such as roads, and parks.

Climate: the long-term averages and variations in weather over a period of several decades, typically 30 years or more.

Climate Change: a change in the state of the climate (whether by natural variability or as a result of human activity) that can be identified (for example by using statistical tests) by changes in the

mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer (Inter-Governmental Panel on Climate Change, 2007).

Climate Variability: variations in the mean state and other statistics of the climate on all temporal and spatial scales, beyond individual weather events.

Ecosystem: a functional unit of nature made of living things (plants, animals and organisms) in an given area that interact with themselves and with nonliving components such as air, water, mineral and soil. These living (biotic) and nonliving (abiotic) components are regarded as linked together through nutrient flows and energy flows.

Green Economy: an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient, and socially inclusive (UNEP, 2011)

Greenhouse Effect

The greenhouse effect occurs naturally in the atmosphere, in which the earth's surface reflects only part of the solar energy coming into contact with it and absorbs the rest. This absorption has a warming effect, in the form of irradiation of energy to the atmosphere. However, on its way through the atmosphere this radiation collides with other gases which slow it down and prevent the energy from escaping to the outside. Instead, it returns to earth, warming up the planet's surface even further.

This produces the "global warming" effect (approximately 4°C over the last 100 years) referred. This enhanced greenhouse effect results in thawing of the Polar Regions, thereby increasing the average sea and ocean levels which, in turn, is already beginning to have serious consequences in certain parts of the planet (floods, cyclones, coastal erosion, etc.).

Greenhouse Gases: A group of compounds that are able to trap heat (longwave radiation) in the atmosphere, keeping the earth warmer than it would be if they were not present. Greenhouse gases are: water vapour, carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons.

Pollution: the presence in or introduction into the natural environment of a substance or thing that has harmful or poisonous effects on land, air, or water.

Natural Environment: all living and non-living things occurring naturally, rather than because of humans.

Natural Hazard: an extreme physical event that occurs naturally and causes harm to humans or to things we care about (for example, components of the natural environment or our economy).

Ozone Layer: a layer in the earth's stratosphere at an altitude of about 6.2 miles (10 km) containing a high concentration of ozone, which absorbs most of the ultra-violet radiation reaching the earth from the sun.

Social Environment: the immediate physical and social setting in which people live or in which something happens or develops. It includes the culture (belief, customs, practices, behaviours etc.) that a person was educated in or lives in, and the people and institutions with whom they interact.